**Ruth Buskirk’s Hot Topics Session –**

**Small Group Work Reporting**

**ZIKA VIRUS**

1. Hot Topic: Zika Virus
2. Benefits: Teach students the nature of science, get them engaged, expose them to multiple fields of biology (public health, statistics, ecology, epidemiology)
3. Potential challenges: time!, challenging for students
4. ELO’s – students will be able to…
   1. Defend the uncertainty of science
   2. Evaluate sources of evidence
   3. Evaluate statistical significance and correlation studies
   4. Provide a biological hypothesis for Zika transmission/pathology
5. Assessment: Is Zika causing microcephaly? Describe the evidence you would need, the data you would gather, and where you would find it to defend your argument (yes or no). Be prepared to defend it at a town hall meeting.
6. Learning Activity: Analyzing Data sources through jigsaw (Below are the groups)
   1. News media graphics
   2. Economist article on the cost of eradication
   3. Medical journal article on the cost of treating microcephaly
   4. Incidence of co-occurrence of microcephaly and Zika
   5. During group work, have discussions about types of evidence and validity
   6. Come together for a class discussion and final breakdown

**ZIKA VIRUS**

1. What is the hot topic? Zika virus
2. Identify and list benefits

**Engage students:** This is hot because it is in the news. Students will get excited about topic because it has major ramifications across the spectrum of humans, ecological implications. Has it become an emergent disease? We are developing a current understanding, there is a lot unknown about Zika virus will help give students and idea of how science work. Spans human impacts to ecology (global issue)

**Current research:** widely researched across the world

**Relate and apply to course content:** relates to viruses, scientific thinking (control vs. experimental group needed to compare effects: ethics of this and how to set it up, hypothesis based testing and how to do this).

**Limitations:** Don’t know much about it, knowledge is largely observation based, accumulating knowledge based on observation, no database of information exists previously

**Increase retention in STEM:**  because they see it in the news, effects travel, close proximity of Mexico, pre-med students will be very interested (lots of them are pre-meds

**Broader impacts:** global community – widespread effects, media around this – global community will do everything to fix this but look at other diseases and how the global community addresses these types of issues previous (particularly with third world countries), also ethical issues related to how you treat this (i.e. gene drives, possible prevention issues, how do we apply these, what are the impact of this).

**Evaluate media sources presenting:** what is first reported in media is not always true, comparisons between NYT and Fox new (Information literacy goals), reliability of primary sources vs. of population media sources.

1. They may just focus on disease but need to think about implications and how it helps understand the other topics in biology, may become a less hot topic later, might deviate student attention from importance of basic biology foundations; so much unknown about the topic.
2. Learning goals:
3. Learning outcomes: Students will be able to describe the ZIka virus reproduction as we understand it; design an new experiment to answer a question we don’t know the answer to; alt. choose a current learning objective related virus reproduction Determine which viral reproduction pathway the ZIka virus follows
4. Class activities: 2-min internet research on Zika virus (what do you know). What are you worried related to ZIka virus – T-P-S;
5. Draw the reproductive cycle of a virus

**GENETIC ENGINEERING, CRISPR**

Objective: Draws in different aspects of Biology Science literacy

Using CRISPR technology students will be able to:

* Understand gene editing
* Apply this technology to patterns of inheritance
* Explain the components of CRISPR
* Model the inheritance of engineered genes
* Explain the effect of CRISPR on cell junction

In-Class Activities:

Design an experiment using CRISPR to solve a problem

**3-PARENT FERTILIZATION**

Topics:

Endosymbionts

Mitochondrial function

Mitochondrial vs nuclear inheritance

Mitochondrial disease

Fertilization

New Techniques

GMO related

No propagation

Destruction of embryos

**3-PARENT FERTILIZATION**

Objectives:

Students able to describe the difference in inheritance of mitochondria vs. nucleus

Discussion waylaid by philosophy

Case Study: Background info, inheritance pattern, looking at pedigree

Is cytoplasm parent? Biological parent? Defend your position with science.

Sub-questions:

-How long of a fix?

-What if Dad has this disease?

**FOR ANY TOPIC** (20 min discussion)

* apply process of science
* evaluate endure/distinguish what literature is saying (primary, secondary)
* interpret graphs/figures
* connect/apply concepts from class to this topic.

Activities:

1. Introduce topic/assign students to look it up by next class and determine primary, secondary, etc.
2. Group work: report at next class
3. Primary literature paper in class groups discuss, abstract/figures in paper, unpack, report
4. Apply to course topics – report

Assessment: Clicker questions, content/affect